CLAIMS

What is claimed is:

1. A method for decoding a pair of audio input signals into a plurality of output channels, comprising the steps of:

determining a plurality of matrix coefficients that each defines a surface as a function of one or more steering angles, where the surface includes a plurality of quadrants and is continuous between the plurality of quadrants, and where the one or more steering angles define a steering; and

determining the plurality of output channels as a combination of the audio input signals and the plurality of matrix coefficients.

2. The method of Claim 1, where the one or more steering angles includes a cs steering angle that defines a cs axis for the surface.

3. The method of Claim 2, where determining a plurality of matrix coefficients includes including a boost along the cs axis for at least one of the plurality of matrix coefficients.

4. The method of Claim 3, where the at least one of the plurality of matrix coefficients includes one or more left front matrix coefficients.

5. The method of Claim 3, where the at least one of the plurality of matrix coefficients includes one or more right front matrix coefficients.

6. The method of Claim 3, where the boost equals about 3 dB when cs equals about zero degrees to about 22.5 degrees.

7. The method of Claim 3, where the boost decreases from 3 dB to about 0 dB as cs increases from about 22.5 degrees to about 45 degrees.

8. The method of Claim 3, where the one or more steering angles include a lr steering angle that defines an lr axis for the surface.

9. The method of Claim 8, where the boost is applied only along about the lr axis.

10. The method of Claim 1, where the plurality of output channels includes a left front output signal, a right front output signal, a center output signal, a left surround output signal, and a right surround output signal.

11. The method of Claim 10, where the pair of audio input signals includes a center component.

12. The method of Claim 11, where determining the plurality of matrix coefficients further includes defining at least one of the matrix coefficients so that the left front and right front output signals include an amount of the center component when the steering is to about a center.

13. The method of Claim 12, where the at least one of the matrix coefficients includes one or more left front matrix coefficients.

14. The method of Claim 12, where the at least one of the matrix coefficients includes one or more right front matrix coefficients.

15. The method of Claim 12, where determining the plurality of matrix coefficients further includes including an amount of the center component in at least another of the matrix coefficients that makes a total power of the plurality of output channels equal to about a total power of the pair of input channels.

16. The method of Claim 15, where the at least another of the matrix coefficients includes at least one center matrix element.

17. The method of Claim 12, where determining the plurality of matrix coefficients further includes limiting one of the one or more steering angles when the center component is about 6 dB stronger in one of the plurality of output channels.

18. The method of Claim 17, where the one of the one or more steering angles includes a cs steering angle.

19. The method of Claim 17, where the one of the one or more steering angles is limited when the steering is to about a center.

20. The method of Claim 10, where determining the plurality of matrix coefficients further includes increasing a loudness of the center output channel so that a total power of the plurality of output channels equals about a total power of the pair of input channels.

21. The method of Claim 20, where the loudness of the center output channel is increased when the steering is to about a center.

22. The method of Claim 20, where the loudness of the center output channel is increased when a level in the left front output channel, the right front output channel, and the center output channel are about equal.

23. The method of Claim 2, where determining a plurality of matrix coefficients includes including a cut along the cs axis for at least one of the plurality of matrix coefficients.

24. The method of Claim 23, where the at least one of the plurality of matrix coefficients includes one or more left front matrix coefficients.

25. The method of Claim 23, where the at least one of the plurality of matrix coefficients includes one or more right front matrix coefficients.

26. The method of Claim 23, where the cut is included when cs equals about 0 to about -45 degrees.

27. The method of Claim 10, further comprising deriving an additional plurality of output channels by modifying a frequency spectrum of the right and left surround output channels.

28. The method of Claim 27, where the additional plurality of output channels includes a right side output channel and a left side output channel.

29. The method of Claim 10, further comprising modifying a frequency spectrum of the right and left surround output channels.

30. The method of Claim 29, where modifying the frequency spectrum includes attenuating frequencies when the steering is about neutral.

31. The method of Claim 29, where modifying the frequency spectrum includes attenuating frequencies when the steering is about forward.

32. The method of Claim 29, where modifying the frequency spectrum includes attenuating frequencies above about 500Hz.

33. A decoder for redistributing a pair of audio input signals into a plurality of output channels, comprising:

a plurality of multipliers each receiving the pair of audio input signals and one or more steering angles;

a matrix coefficient that defines a surface as a function of the one or more steering angles;

where the plurality of multipliers determine an output signal as a function of the pair of audio input signals, the one or more steering angles, and the matrix coefficient, where the surface includes a plurality of quadrants and is continuous between the plurality of quadrants; and

a plurality of summers that each receive the output signal from two of the plurality of multipliers and produce one of the plurality of output channels.

34. A machine-readable medium having instructions stored thereon, comprising:

multiplier code configured to operate on multiple audio input signals and one or more steering angles;

matrix code configured to operate on a coefficient that defines a surface as a function of the one or more steering angles, where the surface includes a plurality of quadrants and is continuous between the plurality of quadrants;

where the multiplier code determines an output signal as a function of the audio input signals, the one or more steering angles, and the coefficient, the multiplier code providing an output signal; and

summer code operable to receive the output signal from the multiplier code and produce an output channel.

35. A method for encoding three or more audio input signals into a pair of audio output channels, comprising the steps of:

determining an amplitude/phase relationship among at least two of the audio input signals and producing at least one control signal therefrom; and

mixing proportions of the audio input signals into the pair of audio output channels so that the pair of audio output channels are stereo compatible.

36. The method of Claim 35 where the proportions are responsive to the one or more control signals.

37. An active encoder for redistributing three or more audio input signals into a pair of output channels, comprising:

means for determining an amplitude/phase relationship among at least two of the audio input signals and producing at least one control signal therefrom; and

means for mixing proportions of the audio input signals into the pair of audio output channels so that the pair of audio output channels are stereo compatible.

38. A machine-readable medium having instructions stored thereon, comprising:

code for determining an amplitude/phase relationship among at least two of the audio input signals and producing at least one control signal therefrom; and

code for mixing proportions of the audio input signals into the pair of audio output channels so that the pair of audio output channels are stereo compatible.